

## THE GENUS DEBARYOZYMA VAN DER WALT & JOHANNSEN, NOM. NOV.

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Klöcker (1909) in order to classify an undescribed, strongly fermentative yeast forming sphaeroidal, visibly verrucose ascospores, introduced the genus *Debaryomyces*. The single species on which the genus was based he named *Debaryomyces globosus* Klöcker.

Accepting the verrucosity of the ascospore as cardinal generic criterion, subsequent authors, notably Konokotina (1913), Guilliermond & Péju (1920, 1921) and Guilliermond (1928) assigned other species to *Debaryomyces*. These species, however, differed from the type species by being only weakly fermentative and utilizing a greater number of carbon sources.

Stelling-Dekker (1931) in her revision of the ascogenous yeasts accepted Guilliermond's (1928) demarcation of *Debaryomyces* which by now comprised predominantly weakly fermentative or non-fermentative species even though the type species was strongly fermentative. Selecting a new type, Lodder & Kreger-van Rij (1952) remodelled the genus so as to retain only those species characterized by a predominantly oxidative metabolism.

In contravention of Articles 7 and 52 of the International Code of Botanical Nomenclature (Stafleu & al., 1972), Lodder & Kreger-van Rij retained the name *Debaryomyces* for the remodelled taxon from which they had excluded the type species, *D. globosus*. This innovation in terms of Article 48 of the Code resulted in the introduction of the name *Debaryomyces* Lodder & Kreger-van Rij to designate the remodelled taxon, based on the

type *Debaryomyces hansenii* (Zopf) Lodder & Kreger-van Rij (Syn.: *Saccharomyces hansenii* Zopf, 1889). As *Debaryomyces* Lodder & Kreger-van Rij is a later homonym of *Debaryomyces* Klöcker, it is in terms of Article 64, illegitimate and must be rejected.

Van der Walt & Johannsen (1975) in a revision of the yeasts forming verrucose, sphaeroidal ascospores, concluded that the maintenance of *Debaryomyces* Lodder & Kreger-van Rij on the basis of criteria such as differences in rates of fermentation and more varied carbon assimilation patterns was tenuous and, since the name *Debaryomyces* Lodder & Kreger-van Rij contravened the Code, proposed that this taxon together with *Debaryomyces* Klöcker be united in *Torulaspora* Lindner (1904).

More recently, however, Yamada & al. (1976, 1977) in their study of the coenzyme Q (or ubiquinone) systems in the ascogenous yeasts provided a more substantial basis for the demarcation of *Debaryomyces* Lodder & Kreger-van Rij. It was demonstrated that, whereas *Debaryomyces globosus* and the species of *Torulaspora* were all characterized by the coenzyme Q-6 system, the species assigned to *Debaryomyces* Lodder & Kreger-van Rij, were consistently differentiated by the presence of the coenzyme Q-9 system. As this difference in the coenzyme Q systems provides an objective, rational basis for the demarcation of the taxon cited as *Debaryomyces* Lodder & Kreger-van Rij, it is proposed to rename this remodelled taxon in accordance with the requirements of the Code, while *D. globosus* Klöcker will be retained in *Torulaspora*.

### **D e b a r y o z y m a van der Walt & Johannsen, gen. nov.**

*Debaryomyces* Lodder & Kreger-van Rij in The Yeasts, Ed. 1. 277. 1952; non *Debaryomyces* Klöcker in C.r. Trav. Lab. Carlsb. 7: 273. 1909.

Cellulae vegetativae praecipue haploideae, globosae, subglobosae, ovoideae vel ellipsoideae, propagantes per gemmationem. Asci ex conjugatione cellularum aequalium vel inaequalium aut ex autogamia somatogamica, raro e transformatione cellularum vegetivarum diploidearum oriuntur. Ascospores globosae vel ellipsoideae, verrucosae, ad 4 in singulis ascis. Systema coenzymatis Q-9 adest. Nitrato non utitur.

Species typica: *Debaryozyma hansenii* (Zopf) van der Walt & Johannsen.

Vegetative cells predominantly haploid, sphaeroidal, subglobose, ovoid or ellipsoidal, reproducing by budding. Asci arise from the conjugation of cells of equal or unequal dimensions, by somatogamous autogamy, rarely by the transformation of diploid, vegetative cells. Ascospores sphaeroidal or ellipsoidal, verrucose, 1–4 per ascus. Coenzyme Q-9 system present. Nitrate not utilized.

TYPE SPECIES.—*Debaryozyma hansenii* (Zopf) van der Walt & Johannsen, *comb. nov.* (basionym, *Saccharomyces hansenii* Zopf in Ber. dt. bot. Ges. 7: 95. 1889).

On the basis of data relating to the Coenzyme Q system and the ascosporal morphology of the species, as provided by Yamada & al. (1976, 1977) and Kurtzman & al. (1975) respectively, the following transfers are effected. —

*Debaryozyma castellii* (Capriotti) van der Walt & Johannsen, *comb. nov.* (basionym: *Debaryomyces castellii* Capriotti in Arch. Mikrobiol. 28: 344. 1958).

**Debaryozyma coudertii** (Saéz) van der Walt & Johannsen, *comb. nov.* (basionym: *Debaryomyces coudertii* Saéz in Bull. mens. Soc. linn. Lyon **29**: 288. 1960).

**Debaryozyma polymorpha** (Klöcker) van der Walt & Johannsen, *comb. nov.* (basionym: *Pichia polymorpha* Klöcker in Zentbl. Bakt. ParasitKde (II. Abt.) **35**: 373. 1912).

**Debaryozyma pseudopolymorpha** (Ramirez & Boidin) van der Walt & Johannsen, *comb. nov.* (basionym: *Pichia pseudopolymorpha* Ramirez & Boidin in Microbiol. esp. **6**: 405. 1953).

**Debaryozyma tamarii** (Ohara & Nonomura) van der Walt & Johannsen, *comb. nov.* (basionym: *Debaryomyces tamarii* Ohara & Nonomura ex van der Walt & Johannsen in C.S.I.R. Res. Rep. **325**: 16. 1975. (Ohara & Nonomura, 1954).

**Debaryozyma vanriji** (van der Walt & Tscheuschner) van der Walt & Johannsen, *comb. nov.* (basionym: *Pichia vanriji* van der Walt & Tscheuschner in J. gen. Microbiol. **15**: 459. 1956).

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